1 kHz to 30 MHz Oscillator using only Three Components

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Building a square-wave oscillator using only three components is always a desirable accomplishment when space is tight, and if you can achieve a frequency range of 1 kHz to 30 MHz at the same time you have a component that can be used an a wide variety of applications.

The Linear Technology LTC1799 (www.linear-tech.com/pdf/1799f.pdf) is the first IC that can manage this feat. It needs only an external resistor R_{SET} to set the output frequency. The value R_{SET} of can be calculated using the formula

$$R_{SET} = 10\,\Omega \times [10\text{ MHz} / (N \times f_{OSC})\,]$$

The frequency range *N* is selected by the voltage applied to the DIV pin (see the table). The output voltage of the IC switches back and forth between the supply voltage and ground ('rail to rail'). The duty cycle is 1:1 or 50%. The LTC1799 comes in an SOT-23 SMD package and thus takes up only a very amount of space on the circuit board.

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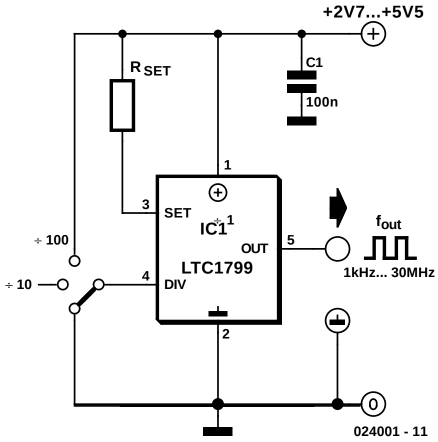

DIV (pin 4)	N	Frequency range
V_{CC}	1	500 kHz to 30 MHz
open	10	50 kHz to 1 MHz
ground	100	1 kHz to 100 kHz